10
↓

sender specifies
recipients and submits
document via
preferred transport

sender
(web preferred)

12

TTP system accepts
submissions from senders and
forwards documents to recipients

use of TTP services requires
authentication through
public key technology

TTP system

11

recipient
(email preferred)

14

internet

13

recipients receive
document via
preferred transport

recipient
(web preferred)

14

documents in transit
are protected
cryptographically

documents in storage
are protected cryptographically
and through access control

timestamps, digital signatures, and
logs are generated and retained

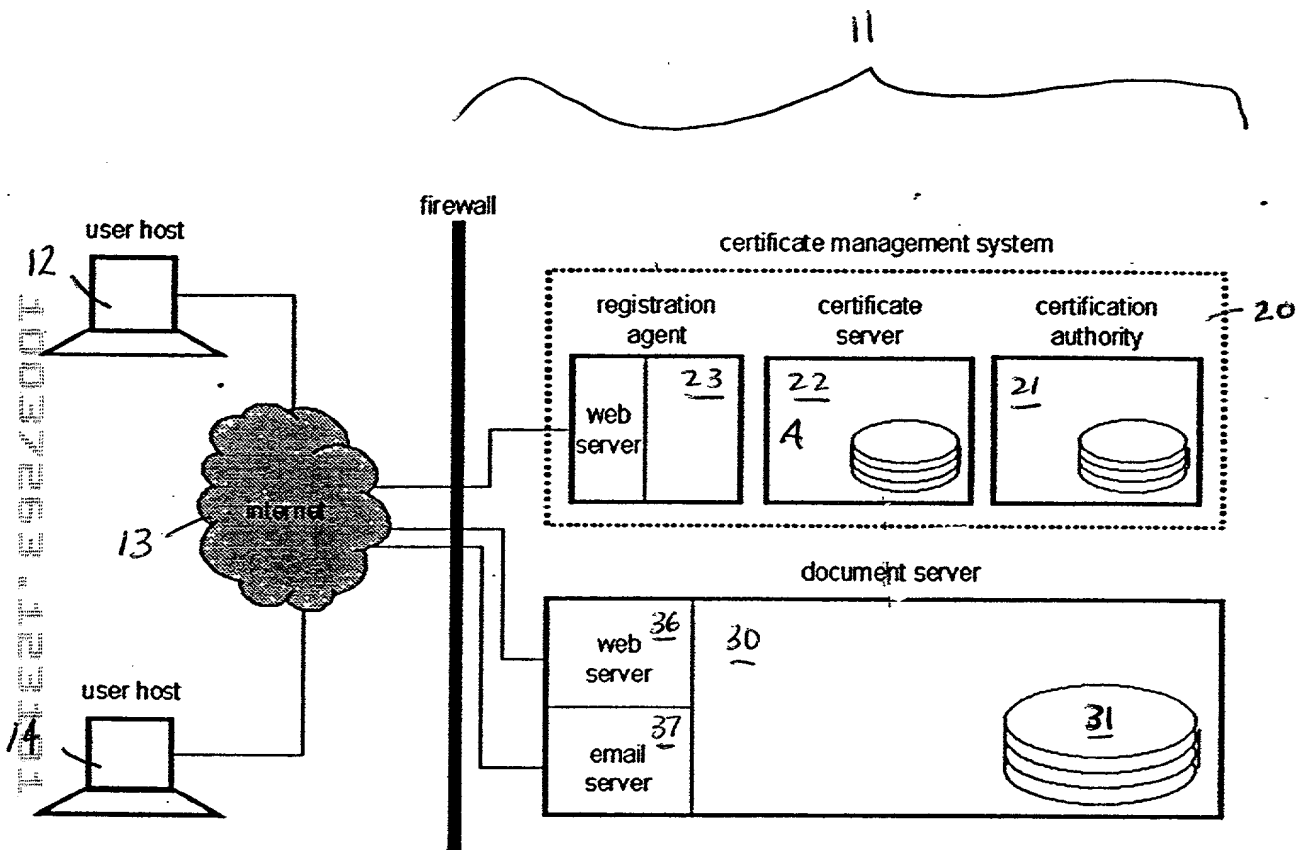*Figure 1. Overview of TTP document transmission and security services.*
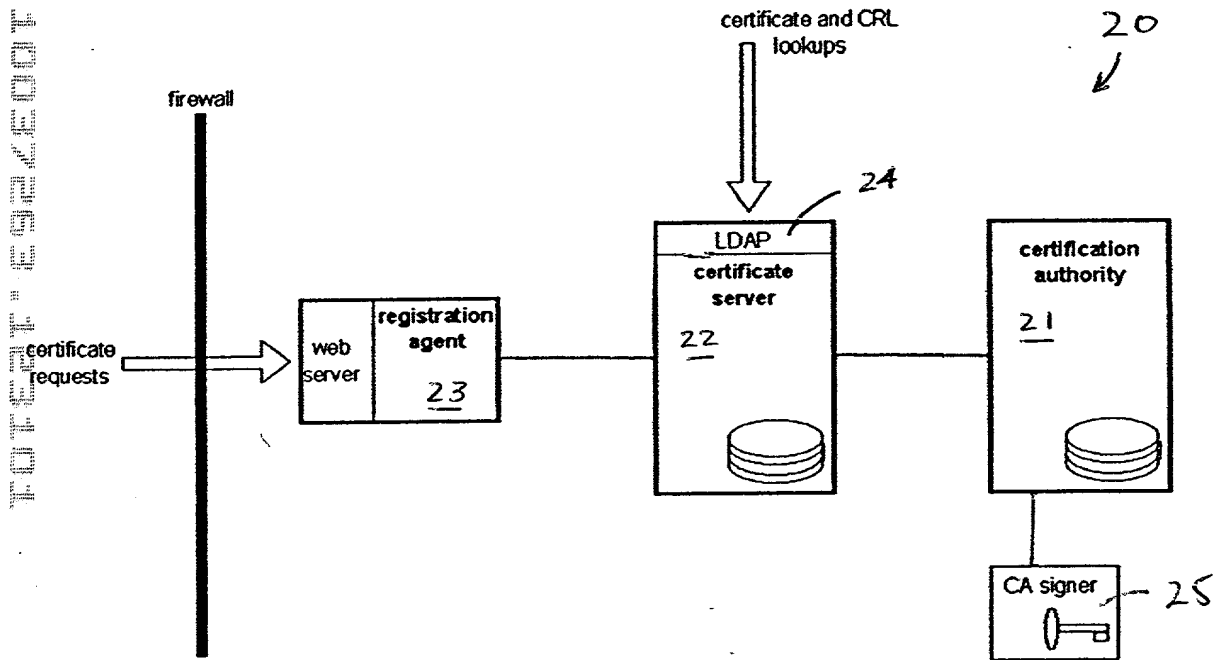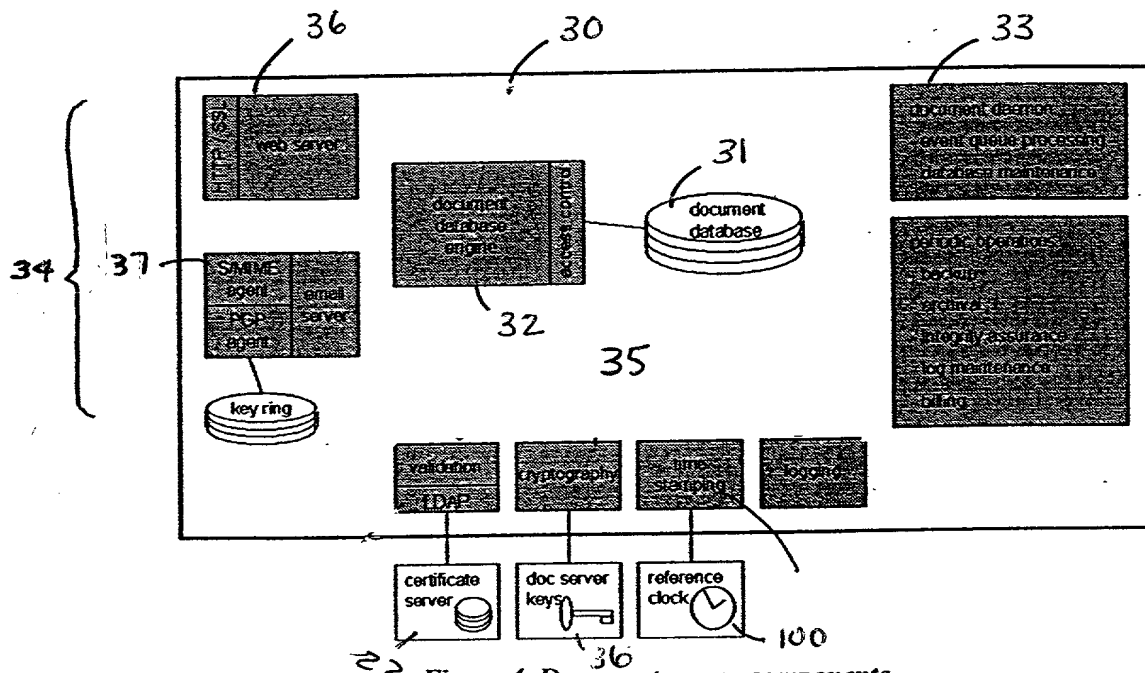
Figure 2. TTP system overview.

certificate and CRL
lookups

20

firewall

24

LDAP

certificate
server

22

certification
authority

21

certificate
requests

web
server

registration
agent

23

CA signer

25

Figure 3. CMS overview.

Figure 4. Document server components.

Figure 5. User hierarchy.

60

61

document root

firmA 62

firmB 62

firmC 62.

63

INBOX case1 case2 64

INBOX clientP clientQ

INBOX docZ

64

docs docX

63

63

cases case464

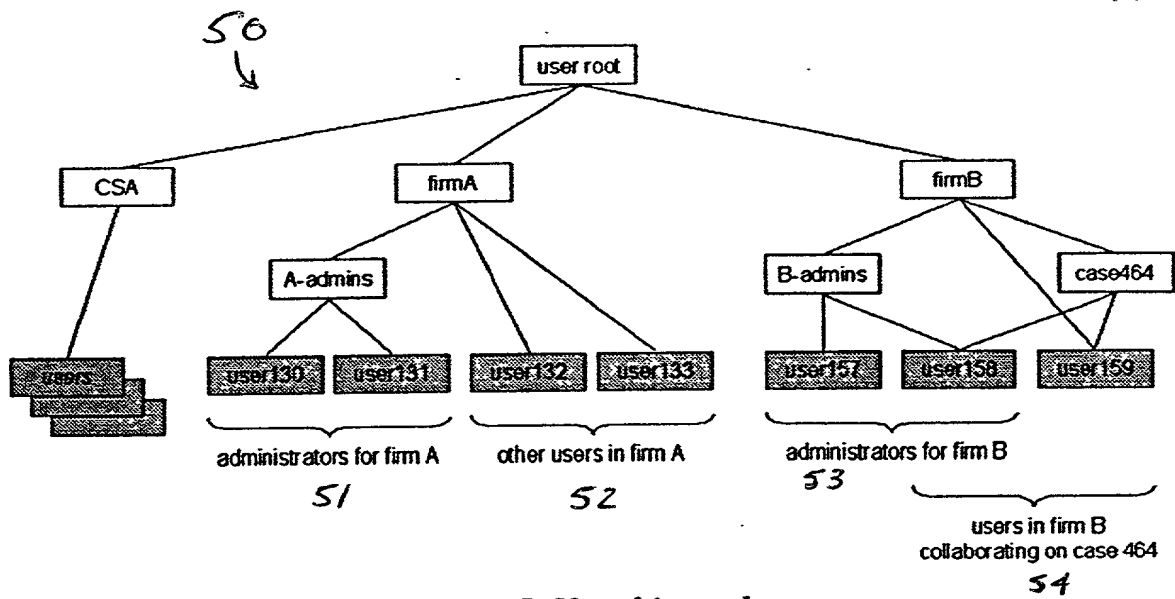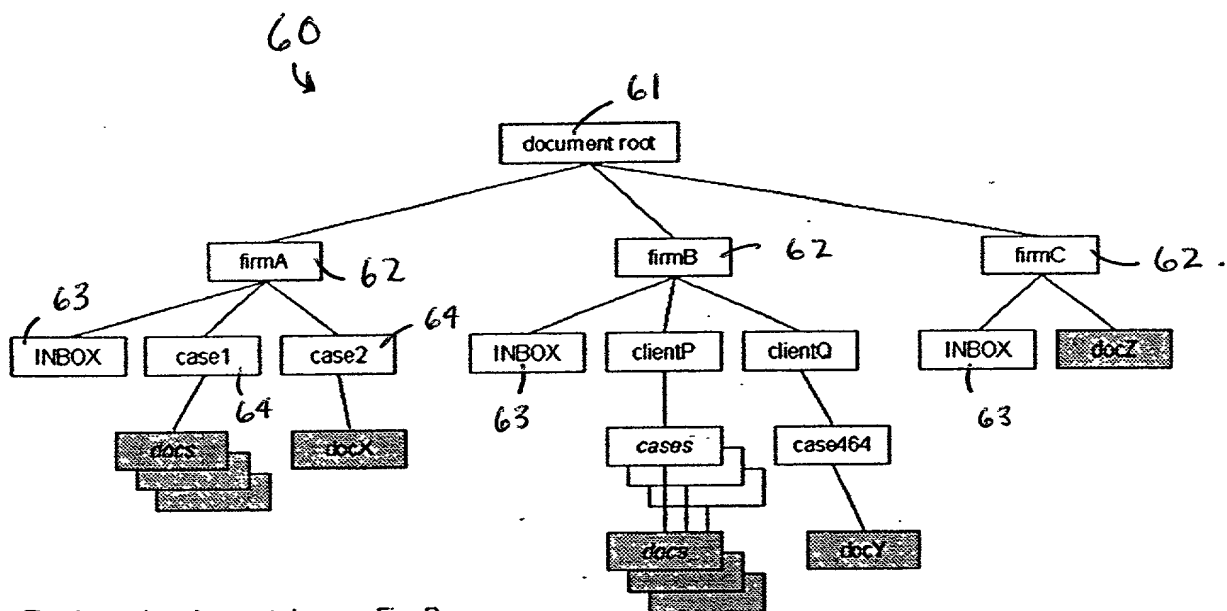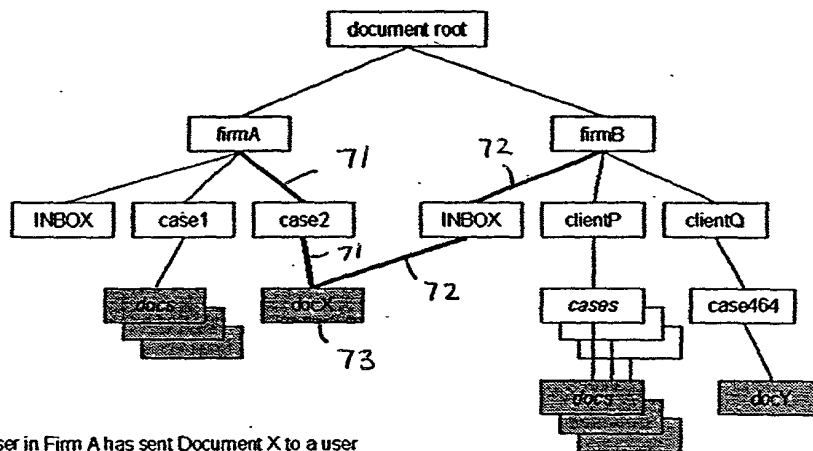docs docY

Firm A organizes documents by case, Firm B
by client and by case, Firm C in a flat category.

Figure 6. Document hierarchy.

document root

firmA   71   72   firmB

INBOX   case1   case2   INBOX   clientP   clientQ

71

72

docs   docX   cases   case464

73

docY   docY

A user in Firm A has sent Document X to a user
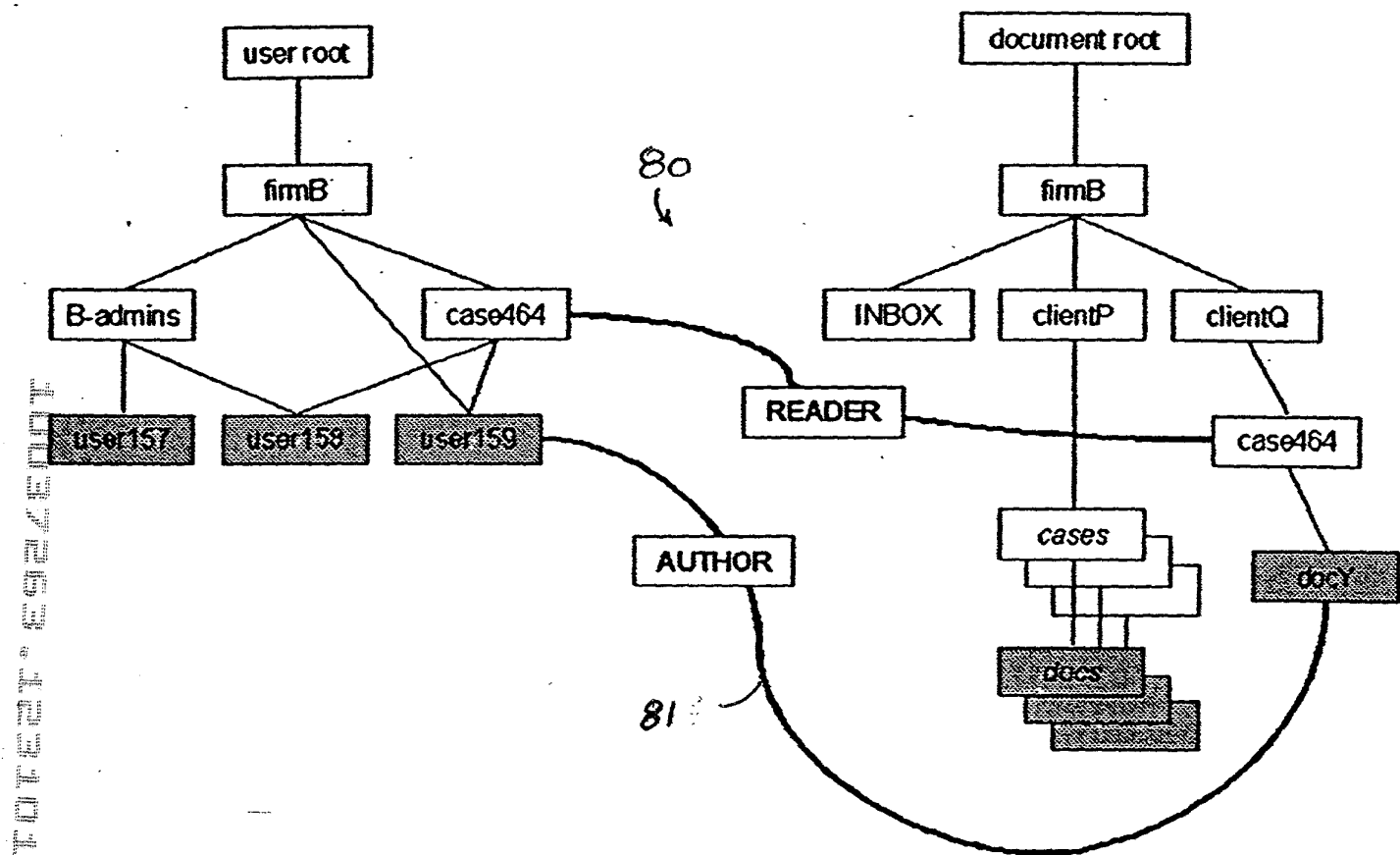in Firm B.

Figure 7. Paths to an uploaded document.

Figure 8. Access control links.

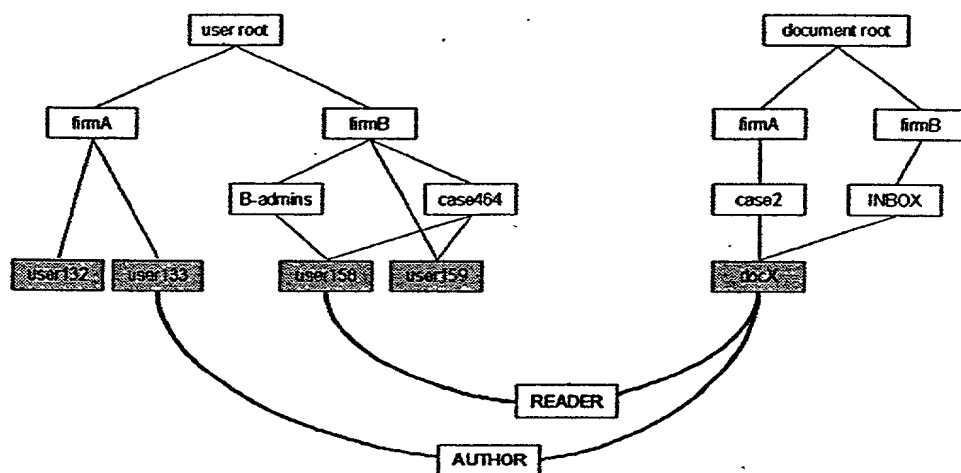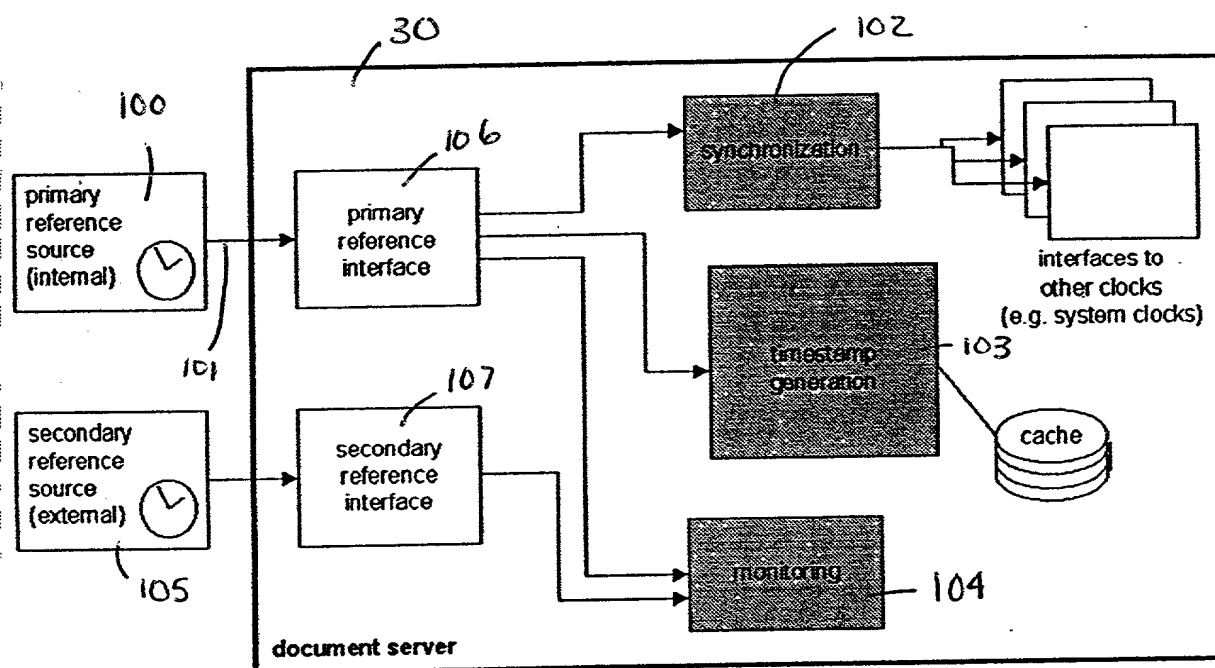*Figure 9. ACLs on an uploaded document.*

Figure 10. Time services.

32 **31** **33**

1. Document submitted with billing info supplied by sender.

1

document
database
engine

access control

2

document
database

document
daemon

2. Billing info stored as billing label with other ancillary data in document database.

document

ancillary data

BILL: Matter 515

110

3

logging

3

document

ancillary data

BILL: Matter 515

event
history

event
queue

3. Document operation records, including billing info, emitted to log.

...

EVENT: send
USER: *sender*
FIRM: *sending firm*
PARTIES: *recipients*
TIME: *timestamp*
BILL: Matter 515

...

111

log
files

113

4

log
postprocessor

4

billing
package

5

112

5. Billing package bills firms and generates usage reports, including billing info.

4. Log postprocessor, scheduled by document daemon and coordinated with log maintenance, parses database engine log files for billable events and generates input for billing package.

document server

Figure 11. Billing services.

Figure 12. Document transmission – user authentication.

36

33

4. Document
downloaded by
web users.

2. Notification and delivery
requests passed to engine.

document
daemon

web server

1. Events
in queue
scheduled by
daemon.

31

document
database

1

4

document
database
engine

2

3

3. Notifications and
deliveries passed to
email server

S/MIME
agent

email
server

PGP
agent

37

document

key ring

ancillary data

32

5. All operations recorded in event
history, with timestamp and signature of
document server, and logged.

35

5

event
history

event
queue

cryptography

time
stamping

logging
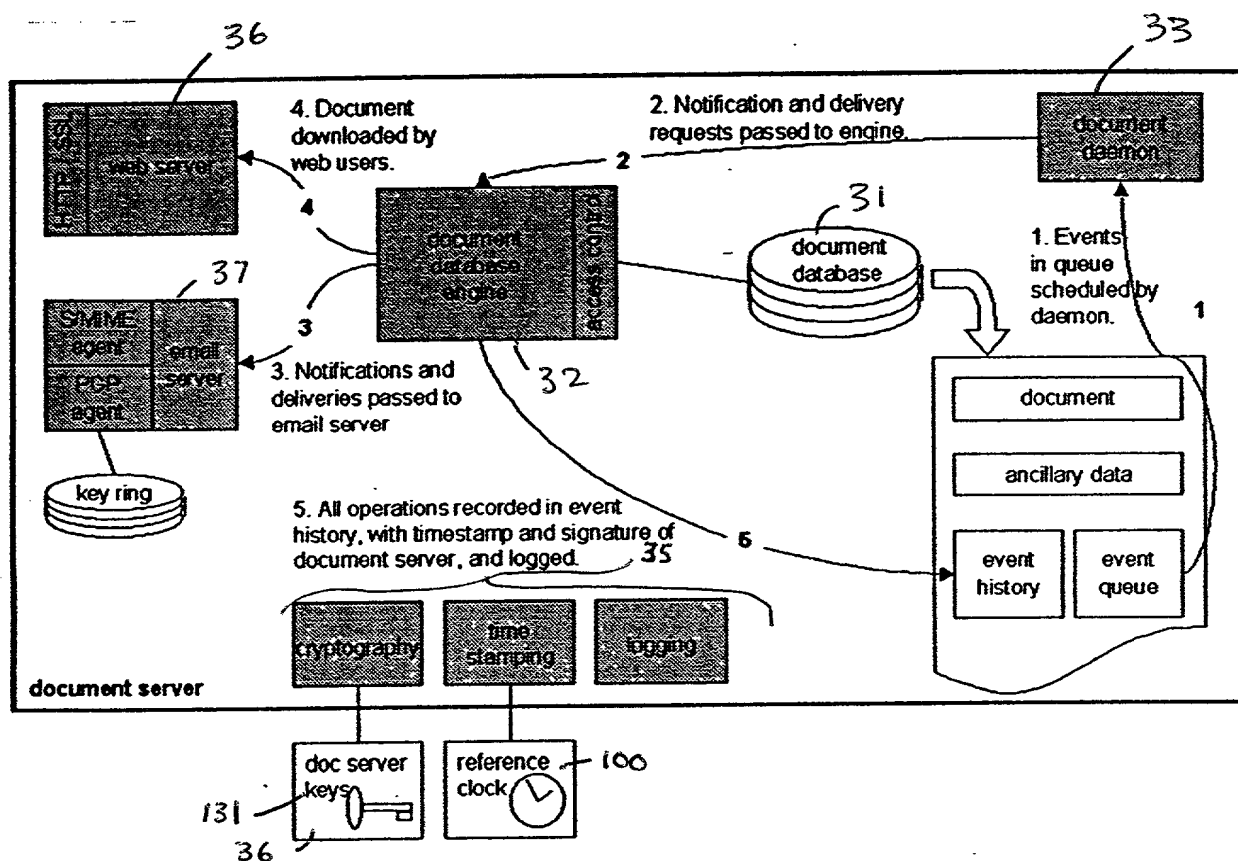
document server

doc server
keys

reference
clock

100
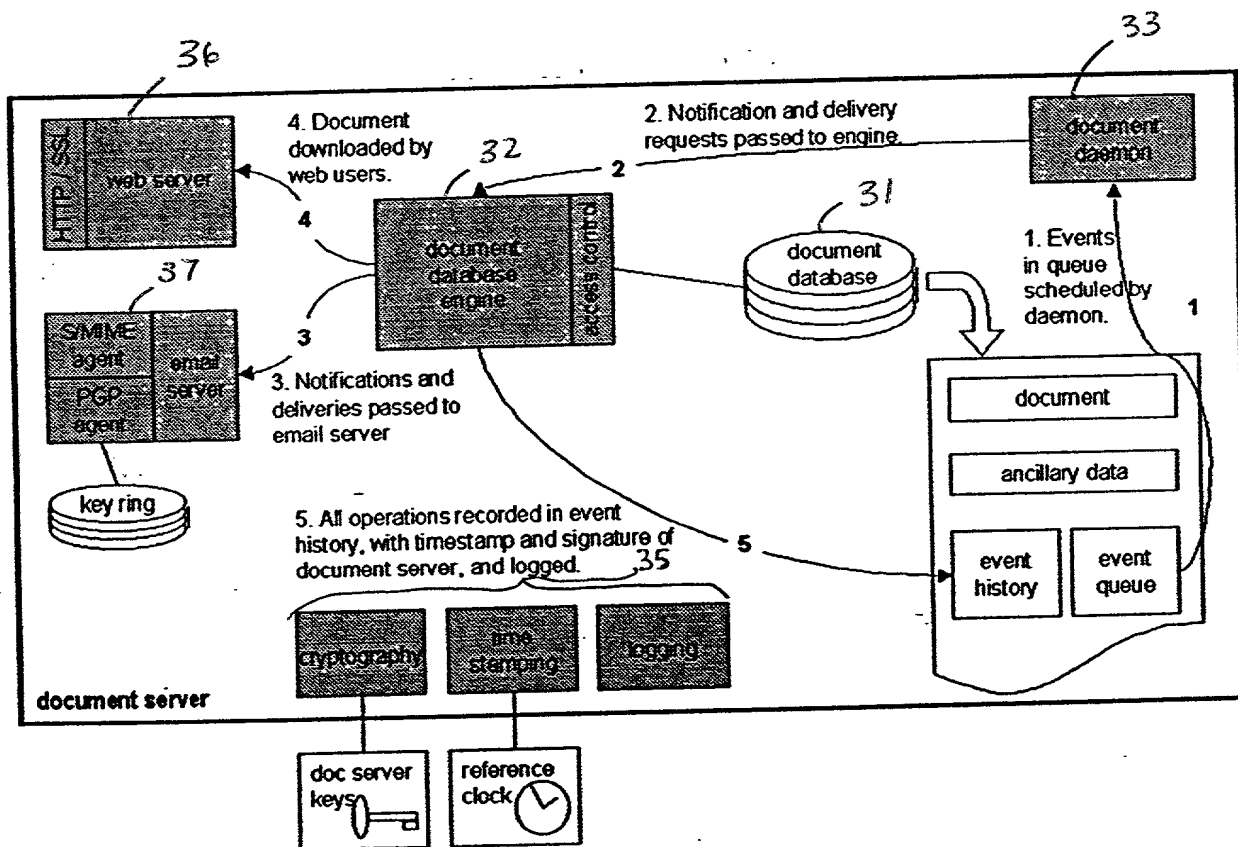
131

36

Figure 13. Document transmission – upload processing.

Figure 14. Document transmission – delivery processing.